



REMARKS

The Applicant has received and reviewed the Office Action dated August 2, 2005 wherein the Office rejected claims 1-6, 10-18, and 20 under 35 U.S.C. §103(a) as being unpatentable over the reference of Chen (U.S. Patent No. 6,580,858).

Although Applicant respectfully disagrees with the Office's above rejections, the Applicant has amended the claims of the present application to more clearly bring out the subject matter being claims.

In regards to Applicant's independent claims 1 and 16, Applicant's independent claim 1 has been amended to now call for a post packaging alignable optical coupling including:

"... a mirror interposed to directly intercept an optical signal from one or the other of said optical elements, said mirror moveably disposed with respect to said base..." (Emphasis added.)

Applicant's independent claim 16 has been amended to now call for an optical coupling including:

"...a repositionable mirror, said mirror having a reflecting surface larger than an optical port, said mirror positioned to directly intercept an optical signal emanating from said first optical element; ..." (Emphasis added.)

The Applicant respectfully submits that the reference of Chen does not teach the above features of Applicant's independent claims 1 and 16. More specifically, the reference of Chen does not teach "...a mirror interposed to directly intercept an optical signal from one or the other of said optical elements..." as called for in amended independent claim 1

or a "...mirror positioned to directly intercept an optical signal emanating from said first optical element ..." as called for in amended independent claim 16. Chen instead teaches that the light 11 from his optical fiber 10 initially strikes the inclined end surface 114 of Chen's substrate 101 before the light 11 is direct to any of Chen's mirrors 120, 121, 131, 132, 133, and 134. In view of the aforementioned, Chen's mirrors 120, 121, 131, 132, 133, and 134 do not directly intercept but instead indirectly intercepts light 11 from his optical fiber 10.

It is submitted that the reference of Chen also does not teach the feature of "... a mirror interposed to directly intercept an optical signal from one or the other of said optical elements" as being "... moveably disposed with respect to said base ..." as called for in Applicant's amended independent claim 1 or "repositionable" as called for in Applicant's amended independent claim 16. Note that the inclined end surface 114 of Chen's substrate 101, which is not a mirror, is also not moveably disposable with respect to Chen's substrate 101 or repositionable as Chen's inclined end surface 114 is integral to Chen's substrate 101.

Applicant's amended independent claim 1 also calls for a MEMS actuator

"...supporting said mirror to enable repositioning said mirror to thereby direct the optical signal directly intercepted by said mirror from said first optical element into alignment with said second optical element or vice versa ..." (emphasis added)

and Applicant's amended independent claim 16 also calls for:

“... a mirror positioning system located on said base to thereby allow an operator to reposition said mirror until the optical signal directly intercepted by said mirror from said first optical element is in optical communication with said second optical element with said mirror positioning system controllable from a position removed from the base.” (Emphasis added)

The Applicant respectfully submits that the reference of Chen does not teach the above MEMS actuator of amended independent claim 1 or the mirror positioning system of amended independent claim 16. Note that the reference of Chen in Figures 2, 3, 4, 5, 6, and 7 specifically shows the inclined end surface 113 of Chen's groove 110 as secured to or integrally formed to Chen's substrate 101 and thus cannot be repositioned by an operator. Further note that a review of the reference of Chen failed to reveal the disclosure of Chen's inclined surface as having any type of actuator or positioning system to enable the repositioning of Chen's inclined surface 113. In regards to Chen's hinge 123, 124, movable platform 136, and actuators 139 and 140, the Applicant respectfully submits that the aforementioned do not enable the repositioning of a mirror that directly intercepts Chen's light 11 as Chen teaches Chen's fixed inclined end surface 113 directly intercepts Chen's light 11 from Chen's optical fiber 10.

In regards to Applicant's independent method claim 10, Applicant's method claim 10 has been amended to now call for a method of packaging an optical coupling including the step of:

“... mounting a positionable mirror on said base so that an optical signal from the first optical element directly impinges on the positionable mirror; ...” (Emphasis added.)

The Applicant respectfully submits that the reference of Chen does not teach the above step as Chen teaches that the light 11 from Chen's optical fiber 10 initially strikes Chen's inclined end surface 114 of his substrate 101 before the light 11 strikes any of Chen's mirrors 120, 121, 131, 132, 133, and 134. In view of the aforementioned, the light 11 from Chen's optical fiber 10 does not directly impinge Chen's mirrors 120, 121, 131, 132, 133, and 134.

Applicant's amended independent method claim 10 also includes the step of:

“... repositioning the mirror after the optical coupling is packaged to bring the optical signal directly impinging the positionable mirror from the first optical element into alignment with the second optical element or vice versa.” (Emphasis added.)

The Applicant respectfully submits that the reference of Chen does not teach the above. As the Applicant argued above, the light 11 from Chen's optical fiber 10 directly strikes Chen's inclined surface before striking any of Chen's mirrors 120, 121, 131, 132, 133, and 134. Since Chen's inclined surface 113 is not movable or repositionable but instead is integrally formed or fixed to Chen's groove 110, it is thus submitted that the reference of Chen does not teach the step of repositioning the mirror of Applicant's amended independent method claim 10.

It is for the above reasons that the Applicant respectfully submits that Applicant's independent claims 1, 10, and 16, as amended, are allowable over the reference of Chen.

In regards to Applicant's dependent claim 11, Applicant's claim 11 calls for a method of packaging an optical coupling as called for in Applicant's independent claim 10 wherein the step of:

“... repositioning of the mirror to align an optical signal from said first optical element to said second optical element is done through rotation and tilting the mirror.” (Emphasis added.)

The Applicant respectfully submits that the reference of Chen does not teach the above step of Applicant's dependent claim 11. More specifically, the Applicant submits that the reference of Chen does not teach the repositioning of a mirror directly impinged by an optical signal from the first optical element through rotation and tilting the mirror. Note that although Chen teaches mirrors 131 and 133 as each being tiltable, Chen does not teach mirrors 131 and 133 as also being rotatable.

On Page 3, lines 19-22, the Office stated that:

“... I would have been obvious to a skill person to have modified the Chen module by replacing the two movable mirrors with a single two-axis mirror since this could accomplish the same x-y positioning with one fewer mirror.”

The Applicant respectfully but strenuously disagrees with the Office's above statement. The Applicant notes that although Chen teaches two movable mirrors 131 and 133, Chen teaches the two movable mirrors 131 and 133 as each being tiltable, but not rotatable. The Applicant respectfully submits that it would not have been obvious to combine the two tiltable mirrors of Chen to form the rotatable and tiltable mirror as called for in the method of Applicant's dependent claim 11.

The Applicant further notes that Applicant's dependent method claim 11 calls for the repositioning of a positionable mirror directly impinged by an optical signal from the first optical element through rotation and tilting the positionable mirror. The Applicant respectfully submits that since Chen's optical fiber 10 directly strikes Chen's inclined surface 113 before striking any of Chen's mirrors 120, 121, 131, 132, 133, and 134 and since Chen's inclined surface 113 is not movable or repositionable, the reference of Chen does not teach the above step of Applicant's dependent claim 11.

In regards to Applicant's dependent claim 12, Applicant's claim 12 calls for a method of packaging an optical coupling of independent claim 10 including the step of:

“... mounting a third optical element to said base and mounting a fourth optical element to said base and mounting a further repositionable mirror therebetween to thereby permit alignment of a further optical signal between said third optical element to said fourth optical element by repositioning said further repositionable mirror. (Emphasis added.)

The Applicant respectfully submits that the reference of Chen does not teach the above step of Applicant's dependent claim 12. Note that Applicant's dependent claim 12 calls for (1) the mounting of a first and second optical element to the base and the mounting of a positionable mirror to permit the alignment of an optical signal from the first optical element to the second optical element and (2) the mounting of a third and fourth optical element to the base and the mounting of a further positionable mirror therebetween to thereby permit alignment of a further optical signal between the third optical element to the fourth optical element. That is, Applicant's dependent claim 12 calls for the use two

(2) mirrors to align two (2) different optical signals. Note that Chen teaches away from Applicant's dependent claim 12 by teaching the use of multiple mirrors, for example four (4) in Chen's Figures 5 and 6, to align one (1) beam of light 11.

In further regards to Applicant's dependent claims 2-6, 11-15, 17-18, and 20, Applicant's dependent claims 2-6 each depend on Applicant's independent claim 1 and Applicant's dependent claims 11-15 each depend on Applicant's independent claim 10. Since Applicant's independent claim 1 and Applicant's independent claim 10, as amended, are allowable for the reasons given above, Applicant's dependent claims 2-6 and 11-15 should also be allowable. Applicant's dependent claims 17-18, and 20 each depend on Applicant's independent claim 16. Since Applicant's independent claim 16, as amended, is allowable for the reasons given above, Applicant's dependent claims 17-18, and 20 should also be allowable.

In view of the above, it is submitted that the application is in condition for allowance. Allowance of claims 1-6, 10-18, and 20, as amended, is respectfully requested. Applicant has enclosed a version of the amendment showing changes made with this response.

Please note that since this is a response to a final Office Action, enclosed please find a Request for Continued Examination (RCE) transmittal form PTO/SB/30 along with a credit card payment of \$790.00 for the RCE filing fee. Please charge any underpayment of fees or credit any overpayment of fees to Deposit Account 10-0210.

Respectfully submitted,

JACOBSON AND JOHNSON

By

A handwritten signature in cursive script, appearing to read "Carl L. Johnson".

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Enclosure